

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Patent Application of

UKUTA et al.

Serial No. 09/932,026

Filed: August 20, 2001

Atty. Ref.: 1035-337

Group: 2871

Examiner: Chung, D.

For: SEMICONDUCTOR DEVICE, LIQUID CRYSTAL  
MODULE ADOPTING SAME, METHOD OF  
MANUFACTURING LIQUID CRYSTAL MODULE AND  
ELECTRONIC EQUIPMENT ADOPTING SAME

\* \* \* \* \*

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

**INFORMATION DISCLOSURE STATEMENT**

- ☒ 1. **PTO-1449 Pursuant to 37 CFR 1.97(b)**  
[within 3 months of filing or prior to 1st Office Action] *N/C*
- ☐ 2. **Statement Pursuant to 37 CFR 1.97(c)**  
[before Final Office Action or Allowance] *N/C*
- ☐ 3. **Fee Payment Pursuant to 37 CFR 1.97(c)**  
[before Final Office Action or Allowance] *\$180.00*
- ☐ 4. **Pursuant to 37 CFR 1.97(d)**  
[before Issue Fee payment] *\$180.00*

The following are submitted in the above-identified application in compliance with 37  
C.F.R. §§ 1.97 and 1.98:

- ☒ 5. A list of documents on Form PTO-1449 together with copies of each  
identified document and a translation or a concise explanation of each non-  
English language document is enclosed herewith.
- ☐ a) The partial translations were provided to the undersigned by the applicants'  
foreign representative. The undersigned has no knowledge regarding the  
pertinency of the partially translated portions vis-à-vis the document as a whole.  
The partial translations are merely provided for whatever convenience they may  
be.


This paper is submitted in accordance with:

- ☒ 6. 37 CFR 1.97(b): [within 3 months of filing or prior to 1st Office Action]
- ☐ 7. 37 CFR 1.97(c): [before Final Office Action or Allowance, whichever is earlier]; and
- ☐ a) The required Statement made in item 9 below; or
- ☐ b) The \$180.00 fee specified in 37 CFR §1.17(p) for submission of this Information Disclosure Statement is authorized in item 10 below.
- ☐ 8. 37 CFR §1.97(d): [before issue fee payment]; and
- ☐ a) The fee (\$180.00) required by 37 CFR §1.17(p) is submitted herewith; and
- ☐ b) The required Statement is stated in item 9 below.
- ☐ 9. Statement under 37 CFR 1.97(e)
- ☐ a) The undersigned attorney of record hereby certifies under 37 C.F.R. §1.97(e) that each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement (each item contained in this IDS was the first citation of that item by a foreign patent office in a counterpart foreign application which occurred no more than three months prior to the filing of this IDS); or
- ☐ b) No item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing this Statement, after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.
- ☒ 10. Please charge all deficiency fees associated with the submission of this Information Disclosure Statement and any other fees applicable to this application to Deposit Account No. 14-1140. An original and one (1) copy of this document are enclosed.

Respectfully submitted,  
NIXON & VANDERHYE P.C.

May 9, 2003

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★ 17 MAR 2003 ★

CHARTERED PATENT AGENTS

Further Search

REPLY DUE 22/4/03

Datum/Date

12.03.03

Zeichen/Ref./Ref.  
J43665EP

Anmeldung Nr./Application No./Demande n°//Patent Nr./Patent No./Brevet n°  
01307252.5-2205/

Anmelder/Applicant/Demandeur//Patentinhaber/Proprietor/Titulaire  
SHARP KABUSHIKI KAISHA

## COMMUNICATION

The European Patent Office herewith transmits the partial European search report under Rule 46(1) EPC relating to the above-mentioned European patent application.

Copies of the documents cited in the search report are enclosed.

The applicant's attention is drawn to the following:

The search Division informs the applicant that if the European search report is also to cover inventions other than the invention first mentioned in the claims, a further search fee must be paid for each of these inventions, within ONE MONTH after notification of this communication.

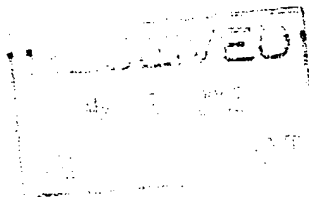
If the application has been filed up to 30 June 1999, the search fee in force before 01 July 1999 (EUR 869,-) or the equivalent applicable on the date of payment is payable.

**This applies also to the search fees requested under Rule 46(1) EPC.**

See also OJ EPO 06/1999, 405.

☐ The abstract was modified by the Search Division and the definitive text is attached to the present communication.

☒ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well. (02)



### Note to users of the automatic debiting procedure:

Unless the EPO receives prior instructions to the contrary, the search fee(s) will be debited on the last day of the period for payment. For further details see the Arrangements for the automatic debiting procedure, Supplement to OJ EPO 02/1999.

REGISTERED LETTER



European Patent  
Office

# PARTIAL EUROPEAN SEARCH REPORT

Application Number

under Rule 46, paragraph 1 of the European Patent Convention EP 01 30 7252

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 911 678 A (SEIKO INSTR INC) 28 April 1999 (1999-04-28)  * paragraph [0019] - paragraph [0031]; claims; figures 1,2 *	1,4,7, 11,13, 15,16	G02F1/13 H01L23/48 H05K3/36
Y	---	5,6	
Y	EP 0 609 074 A (SHARP KK) 3 August 1994 (1994-08-03) * column 24, line 34 - column 34, line 57; figure 6B *	5,6	
A	---		
	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 04, 31 August 2000 (2000-08-31) -& JP 2000 031636 A (MATSUSHITA ELECTRIC IND CO LTD), 28 January 2000 (2000-01-28) * abstract *	1,2,5,7, 11,13, 15,16	
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	-/--		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			G02F H05K

## LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

The present partial European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

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EPO FORM 1503 03 82 (3/4C27)

Place of search	Date of completion of the search	Examiner
MUNICH	27 February 2003	Kiernan, L
CATEGORY OF CITED DOCUMENTS		
X : particularly relevant if taken alone		
Y : particularly relevant if combined with another document of the same category		
A : technological background		
O : non-written disclosure		
P : intermediate document		
T : theory or principle underlying the invention		
E : earlier patent document, but published on, or after the filing date		
D : document cited in the application		
L : document cited for other reasons		
& : member of the same patent family, corresponding document		

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 01, 31 January 2000 (2000-01-31) -& JP 11 271793 A (TOSHIBA CORP), 8 October 1999 (1999-10-08) * abstract *	2,9,14	
A	US 4 862 153 A (NAKABU SHIGEO ET AL) 29 August 1989 (1989-08-29) * column 3, line 43 - column 4, line 49; figure 5 *	8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1,2,4-6,7-9,11,13-16

The subject-matter of claims 1,2, 4-6,7-9, 13-16 concerns the definition of the structural components of a semiconductor device or liquid crystal module which contains a semiconductor element mounted on one side of a flexible substrate. The flexible substrate is folded down in a U-shape such that the semiconductor element faces a member which is connected to the end terminals of the flexible substrate (see Fig. 1).

Claim 11 defines a method suitable for manufacturing the liquid crystal module of claims 7-10. Said method involves bonding a spacer to the back surface of a flexible substrate and folding an end portion of the flexible substrate in a U-shape and fixing the folded end portion to the spacer. Then the connection terminals of the flexible substrate are connected to a liquid crystal panel (see Fig. 6(a)-8(c)).

2. Claims: 3, 10

The subject-matter of claims 3 and 10 concerns the definition of the structural components of a semiconductor device which contains a semiconductor element mounted on one side of a flexible substrate. The device and module also contains a printed wiring substrate. The flexible substrate is folded at both ends in a U-shape such that the semiconductor element, the printed wiring substrate and a member, connected to the end terminals of the flexible substrate, are substantially in the same plane (see Fig. 4).

3. Claim : 12

Claim 12 defines a method suitable for manufacturing the liquid crystal module of claims 7-10. Said method involves partially folding down the end portion of a flexible substrate and connecting the end terminals of the flexible substrate to a liquid crystal panel. A spacer is then connected, by bonding, to the partially folded end of the flexible substrate. Finally, the flexible substrate is folded down into a U-shape around the spacer (see Fig. 9(a)-10(c)).

The three groups of claimed devices are linked by the concept of folding a conductive flexible substrate which connects at least 2 electronic components. However, this concept is clearly neither novel nor inventive, as required by Article 82 EPC. The application has been divided into the above groups of inventions which individually are considered to meet the requirement of unity.

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 01 30 7252

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

27-02-2003

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
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